

Traer Street Bridge
(Shell Rock River Bridge)
Spanning Shell Rock River
Greene
Butler County
Iowa

HAER IA-9

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IOWA,
12-GREENE,
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PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

Historic American Engineering Record
National Park Service
Department of the Interior
Washington, D.C. 20240

HISTORIC AMERICAN ENGINEERING RECORD

TRAER STREET BRIDGE
(Shell Rock River Bridge)

IA-9

Date: 1902-1903
Location: Spanning the Shell Rock River at
Traer Street in Greene, Butler
County, Iowa.

Designed by: Clinton Bridge and Iron Works

Present Owner: City of Greene
City Hall
Greene, Iowa 50636

Present Use: Vehicular and pedestrian bridge

Significance: The Traer Street bridge at Greene, Iowa, is a single-span Pennsylvania (Petit) through truss erected 1902-1903. Its very light design was consistent with the limited requirements of small-town vehicular traffic at the turn of the century, but its length (almost 250 feet) was somewhat unusual for single-span bridges built in rural Iowa at this time.

The bridge was designed, fabricated and built by the Clinton Bridge & Iron Works of Clinton, Iowa, the state's largest and most enduring bridge firm; and was one of many truss bridges erected by the firm in Iowa and western Illinois during the late 19th and early 20th centuries. The bridge, and its two predecessors as well, served an important role in Greene's economy. They opened the town, with its grain elevators, to farmers south and west of the Shell Rock River, thus giving the town access to a

market area much larger than would have been the case had no bridge existed at this place.

Project Information:

The Traer Street Bridge, Greene, Iowa was documented July-September, 1980 by Dennett, Muessig and Associates, Ltd., Iowa City, Iowa, for the Butler County Board of Supervisors and the City of Greene, Iowa. The project team consisted of Robert A. Ryan, Photographer, and Martha H. Bowers, Project Historian and Photographer's Assistant.

Transmitted by:

Gary R. Arabak, 1983.

DESCRIPTION

The Traer Street Bridge IA-9
(Shell Rock River Bridge)(page 3)

The bridge over the Shell Rock River at Greene was built in 1902-1903. It is located on Traer Street, the community's principal thoroughfare. The business district stretches northeast along Traer for a distance of about 3 blocks from the bridge, ending at the railroad crossing beyond which is residential area. A few small businesses are located on Traer off the south end of the bridge, but most construction on this side of the river is residential, with several churches about a block away from the bridge. There is a dam approximately 15 yards downstream from the bridge. The bridge is a single-span, pin-connected Pennsylvania (Petit) through truss, measuring 249'8" pin to pin, with a width of 21'5" center to center of the trusses. Six-foot wide pedestrian walkways are hung on cantilever brackets outside the trusses on each side. Each truss consists of 14 panels, 17'10" center to center. The bridge is 37' high (center to center) at the middle of the span, with hip verticals measuring 20' center to center. The polygonal top chords are formed by pairs of channels joined with cover plates and lacing bars. The bottom chord on each side consists of two pairs of rectilinear eyebars. Paired channels with lacing bars are used for the main vertical compression members. Nominal posts, main (top) and horizontal middle struts are latticed open I-beams. Diagonal and vertical tension members are pairs of rectilinear eyebars. Pairs of thin rectilinear eyebars, used alone or with slender rods with

turnbuckles, function as counters. The top lateral bracing consists of thin rods, while rectilinear eyebars are used for the bottom lateral bracing. Sway braces are also rods, with turnbuckles. The portal bracing consists of ells set in a wide diamond lattice pattern. Plates, centered atop each portal strut, give the date (1902) and builder (Clinton Bridge and Iron Works, Clinton, Iowa). A plate on each east-side inclined end-post lists the Butler county supervisors for 1902: J.F. Wade, Stanley Conn and John F. Mott.

The floor beams, 24'4" end to end, are I-beams hung from U-bolts. The beams support wood stringers and plank flooring covered with asphalt. The wood plank pedestrian walkways have metal lattice balustrades with wooden "newel" posts at each end.

Support at the abutments consists of a fixed shoe at each end; while the north end originally featured a roller bearing to permit lateral movement of the truss. The abutments are limestone, built in 1880 and reused in 1902, and now totally faced with concrete.

Lack of maintenance records has made the dating of alterations uncertain. The truss itself remains in original condition, but the wood stringers and flooring have been replaced at least twice (1917 and c. 1951, according to the Butler County Engineer, Robert Haylock). They may also have been replaced in 1929, when drawings for reflooring were made. These drawings included plans for removal of the roller bearing on the north

end, and replacement of the bridge seats with new grillages and concrete block bases. The abutments were refaced in 1972. Volume and weight of vehicular traffic have exceeded the bridge's design, and the bridge is now closed to anything over 4 tons.

CONSTRUCTION HISTORY

The bridge is the third constructed on this site, and perhaps due to the fact that it was simply a replacement, its erection occasioned little comment in the local press; and its by then common design would have sparked no interest from contemporary engineering journals. The date of Greene's first bridge, a two-span timber Howe through truss, is given variously as 1871 or 1872.¹ This bridge was soon found to be "too low and...otherwise unsatisfactory," and local agitation began as early as 1875 for a replacement.² The second bridge, begun in April 1880 and funded solely by the community, was a two-span iron Pratt through truss, with limestone abutments and pier.³

Twenty-two years later, in April, 1902, the Butler County Board of Supervisors awarded the contract for yet another bridge, to the Clinton Bridge and Iron Works. It was to be a single span, "built substantially and durably."⁴ The reason for a new bridge at Greene is unclear: the two existing spans were apparently sound, as they were relocated to separate sites

over the West Fork of the Shell Rock River.⁵ Political motives are possible: the new bridge's principal advocate was John F. Wade, county supervisor from 1897 to 1903, who made all announcements concerning the bridge and was present at the official acceptance of the bridge in February 1903, even though he was no longer in office. Wade was from the rural village of Aredale, southwest of Greene. Both communities were located in the second county district, which had returned Wade to the Board of Supervisors 5 times. From Chairman of the county board, Wade went on to serve as state senator from 1904 to 1908. It is possible, then, that a new bridge for Greene (one of the largest towns in the second district) had quite positive political implications for Wade.⁶

Construction was delayed at first, however, because townspeople feared they would have no functioning bridge on July 4, annually the occasion of a large parade.⁷ Thus, work did not begin until after that date, with lumber arriving on July 12. At this time, the builders decided to use the existing abutments, which were "deemed sufficient and all right to support the new structure."⁸

The actual erection of the span did not begin until December 29. Although reasons for this delay have not been documented, it may have been due to the time required to remove both of the existing spans most carefully, for reuse elsewhere in the county.⁹ Once begun however, the bridge went up quickly,

with members of the Board of Supervisors making inspection tours on New Year's Day and again on 15 January 1903.¹⁰

A sense of urgency in the matter was illustrated by the fact that a number of local men were hired at \$1.75 per day "to help rush the work."¹¹ The work was indeed rushed: the Board of Supervisors formally accepted the bridge on February 7, less than 6 weeks after work commenced. The total cost was \$10,000, and it was described in typical small-town fashion as "undoubtedly the best bridge in the county."¹²

The Pennsylvania truss span erected by the Clinton Bridge and Iron Works for Butler County was but one of many bridges that the firm produced for counties and towns in Iowa and Illinois in the late 19th and early 20th centuries. As Dr. James Hippen notes,¹³ the bridge at Greene was very lightly designed, since it would serve only vehicular and pedestrian traffic (rather than railroad trains), and probably also because county finances were limited. The decision to retain the 1880 abutments, and to reuse the 1880 spans elsewhere in Butler County, seems to support the latter supposition.

The Pennsylvania truss form was by 1902 a very common bridge type, used principally for long-span railroad and highway bridges. The Penn truss was a variation (several times removed) on the Pratt truss, patented in 1844. Two "descendants" of the Pratt were the Parker (with a polygonal top chord) and the Baltimore (featuring a straight top chord like the Pratt but

having subdivided panels through the use of subtruts and subties). The Pennsylvania truss (named, like the Baltimore, after the railroad line that used it extensively) combined the Parker's polygonal top chord with the Baltimore's strength-enhancing subtruts and subties.¹⁴

THE HISTORICAL CONTEXT

Coldwater Township, in which the town of Greene is located, was first settled in 1852. In 1854, John W. Miller purchased land on the east bank of the Shell Rock River. He built a log cabin that doubled as a "hostelry", and also as a post office named "Elm Springs", then died in 1856.¹⁵

Development of the area did not go much further until 1871, when the Burlington, Cedar Rapids and Northern Railroad extended a line along the east bank of the Shell Rock. Among the lands acquired by the railroad were John Miller's original holdings, on which a town was platted in September of that year. The town was named for Judge George Greene of Dubuque, then president of the line, who gave \$1200 for a public library on condition that the community bear his name.¹⁶

Within two years, Greene had a population of 500, a grain elevator, and a wagon bridge that cost \$7000, \$5000 coming from the county and \$1000 each from the town and the railroad.¹⁷ The following year (1874) E. Hiller erected a grist mill and dam (where the present dam and Iowa Power and Light Co. are located today), the first of several water-

powered industries that grew along the east bank of the river.¹⁸ Early on, the timber wagon bridge facilitated development on the west bank. Greene's western boundaries began to grow in 1873-1874, with the platting of Traer's First and Second Additions, on land originally purchased by the railroad (looking toward this eventuality) in 1871.¹⁹ However, the heart of the town remained on the east side, where the railroad, grain elevators, industries and major commercial houses were located. The west side did not (as was sometimes the case in communities that spanned rivers) develop a separate commercial or industrial center, but remained an area of residential expansion.

The existence of a bridge at Greene thus permitted the town to grow on both sides of the Shell Rock River, but its residential areas could have as easily been confined exclusively to the east side. The importance of the three successive bridges built here derives from a larger context.

The town of Greene lies in the extreme northeast corner of the township, which is in turn adjacent to the Butler-Floyd County line. Seventeen miles northeast of Greene is Charles City, Floyd county seat and long a major market center in north central Iowa. Without a bridge over the Shell Rock River, Greene would, from the first, have been limited to competing with Charles City for the grain and commerce of farmers living north and east of the river, and would have been effectively cut off from its own county seat at Allison,

11 miles to the south. With the early construction of a bridge, Greene was from the beginning open to commerce from farmers at all points of the compass, who would bring their grain by wagon, or, later, truck, to the town's elevators, and stay to do business with Greene's merchants. The existence of a bridge thus doubled Greene's effective market region, and ensured a measure of economic independence from the domination of Charles City.

THE BUILDER

Clinton Bridge and Iron Works was probably Iowa's largest fabricator and builder of bridges in the late 19th and 20th centuries. The firm was organized as the Clinton Bridge Company in 1875 by Artemus Lamb, one of the city's great lumber magnates (another, W.J. Young, was on the board of directors).²⁰ A reorganization in 1877 "greatly increased its capacity."²¹ By the time Clinton County's 1879 history was compiled, the company had erected "267 structures of all kinds and combinations of wood and iron trusses and arches," and employed 50 to 100 men, depending upon the season.²² The Iowa Industrial Census for 1880 noted that the company had a \$25,000 capital investment, and a product value during the previous year of \$183,913.

Sometime between 1880 and 1886, the company was sold to C.C. Keeper, and the name expanded to "Clinton Bridge

and Iron Works." According to the 1976 county history, the new name reflected a merger "a few years after 1875" between Clinton Bridge Company and the Union Iron Works, another local firm founded by Abram P. Hosford in 1868.²³ In 1892, the company was acquired by George Wilson, of Sterling, Illinois. Counties and towns in Illinois and Iowa, and as far east as Indiana, provided an ample market for the company's bridges.²⁴ According to Richard O. Wilson,²⁵ the Clinton Bridge and Iron Works specialized in no particular truss form, instead producing designs -- and budgets -- tailored to the particular requirements of the sites and the clients.

Structural steel gradually replaced iron in the firm's production, and the company name reflected this trend by dropping "Iron Works" and going back to the original "Clinton Bridge Company". During World War II, Clinton Bridge entered joint ventures with four other steel firms, as the Allied Steel Companies, the better to compete against much larger manufacturers for lucrative defense contracts. After the war, the firms set up a partnership, incorporated in Virginia. In 1964 the brothers George and Richard Wilson, the third generation to own and operate the bridge company, sold out. It continues to operate in Clinton as Allied Steel Company.

FOOTNOTES

- 1 Irving A. Hart. History of Butler County, Iowa (2 Vols.). Chicago: S.J. Clarke, 1914. Vol. I. p. 291; Greene Centennial Book Committee, History of Greene, 1879-1979 (hereinafter cited as Centennial). Lake Mills, Ia.: Graphic Publishing Co., 1979, p. 40 .
- 2 Iowa Recorder, 17 July 1929, Section 7, p. 9.
- 3 Centennial, p. 40.
- 4 Iowa Recorder (Greene, Ia.) 22 April 1902, 512.
- 5 Iowa Recorder, 17 July 1929, Section 7, p. 9.
- 6 Hart, pp. 77-78; 97, 256.
- 7 ibid.
- 8 Iowa Recorder, 16 July 1902, 5:3.
- 9 Iowa Recorder, 17 July 1929, Section 7, p. 9.
- 10 Iowa Recorder, 7 January 1903, 5:3; 21 January 1903, 5:3.
- 11 Iowa Recorder, 31 December 1902, 7:13.
- 12 Iowa Recorder, 11 February 1903, 4:2.
- 13 Letter Report, Dr. James C. Hippen to John Hotopp, Office of State Archaeologist, 18 February 1980.
- 14 T.Allan Comp and Donald Jackson, "Bridge Truss Types: A Guide to Dating and Identifying," AASLH Technical Leaflet 95, Nashville, Tennessee 1977, pp. 3-5.
- 15 Hart, pp. 284, 287-289.
- 16 Centennial, pp. 17, 18.

- 17 Hart, p. 291.
- 18 Centennial, pp. 79-80; Hart, p. 293.
- 19 Centennial, p. 25.
- 20 History of Clinton County, Iowa. Chicago: Western
Historical Co., 1879, p. 524.
- 21 P.B. Wolfe. Wolfe's History of Clinton County, Iowa.
Indianapolis: B.F. Bowen, 1911. Vol. I, p. 372.
- 22 History of Clinton County, Iowa. (1879), p. 524.
- 23 Clinton County Historical Society, History of Clinton
County, Iowa. Privately printed, 1976, p. 127;
History of Clinton County, Iowa (1879), pp. 524-5.
- 24 Wolfe, p. 372.
- 25 Personal communication (telephone) from Richard O. Wilson,
Key Biscayne, Florida, to Martha H. Bowers, 18 August
1980.